

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants:	Arye Malek et al.	Examiner:	John Q. Nguyen
Serial No.:	09/350,251	Group Art Unit:	3653
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Title:	TRAY FLIPPER AND METHOD FOR PARTS INSPECTION		

**APPEAL BRIEF TO THE BOARD OF
PATENT APPEALS AND INTERFERENCES OF THE
UNITED STATES PATENT AND TRADEMARK OFFICE****MAIL STOP APPEAL BRIEF - PATENTS**

Commissioner for Patents
P.O Box 1450
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Appellants' Brief on Appeal

This brief is presented in support of the Notice of Appeal filed on April 22, 2007, from the final rejection of then-pending claims 3-10, 12-21, 27-30, 37-40, 42, 43, 45, 46 and 48-51 of the above-identified patent application. The Final Office Action from which Appellants appeal was mailed February 5, 2007.

Appellants respectfully request reversal of the Examiner's rejection of then pending 3-10, 12-21, 27-30, 37-40, 42, 43, 45, 46 and 48-51. This Appeal Brief is in support of a reinstatement of appeal, since the Examiner withdrew the first final rejection of April 15, 2003 and reopened prosecution after Appellants' first Appeal Brief filed September 22, 2003, and subsequently withdrew the second final rejection of June 10, 2004 and reopened prosecution after Appellants' second Appeal Brief filed May 19, 2005. It is believed that no further fee is due under in 37 C.F.R. § 41.20(b)(2), since Appellants paid such a fee with the first Appeal Brief filed September 22, 2003, and the issues, if changed, were changed by the Examiner who reopened prosecution after appeal (see MPEP 1208.02); however, if an additional fee for this or for any other reason is deemed to be due, such fees may be charged to Deposit Account No 502931.

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(i) Real Party in Interest

The present patent is assigned to Charles A. Lemaire, a person residing at 13195 Flamingo Court, Apple Valley, MN 55124, in an Assignment from PPT Vision Inc., filed for recordation on November 3, 2004 and recorded on Reel 015961 Frames 0596-0597, which in turn was from an assignment from the inventors recorded on October 8, 1999, Reel 010306 Frames 0875-0878.

(ii) Related Appeals and Interferences

There are no other appeals or interferences known to Appellant which will have a bearing on the Board's decision in the present appeal.

(iii) Status of Claims

Claims 3-10, 12-20, 27-30, 37-40, 42, 43, 45, 46 and 48-51 are pending in this application. None of the claims are allowed. Claims 1-2, 11, 21, and 26 are cancelled. (Please note: In reply to the April 7, 2007 Advisory Action, Appellant filed an Amendment and Response on April 22, 2007, in which claim 21 was cancelled. The subsequent, April 30, 2007 Advisory Action which addressed Appellant's April 22, 2007 Amendment and Response, stated that "For purposes of appeal, the proposed amendment(s) ... will be entered ..." – proposed amendments in which claim 21 was cancelled – but the Advisory Action then listed claim 21 as still being a pending claim that was rejected.) The April 30, 2007 Advisory Action stated that Appellant's reply had overcome rejection(s) under 35 U.S.C. § 112 Paragraph 2 (which pertained to claims 21, 49, 51), and these overcome rejections of the Final Office Action are therefore not addressed in this Appeal Brief. Claims 3-10, 12-20, 27-30, 37-40, 42, 43, 45, 46 and 48-51 are presently rejected, and claims 22-25, 31-36, 41, 44, and 47 are withdrawn and all these are the subject of the present appeal.

(iv) Status of Amendments

Per the Advisory Action mailed April 30, 2007, claims 3-10, 12-21, 22-25, 27-30, 31-36, 37-40, 41, 42, 43, 44, 45, 46, 47 and 48-51 were entered. (However, as noted in the preceding

paragraph, Appellant cancelled claim 21 in an Amendment filed April 22, 2007, and the April 30, 2007 Advisory Action stated that “For purposes of appeal, the proposed amendment(s) ... will be entered ...”)

(v) Summary of the Claimed Subject Matter

The present application is directed to a system and method for flipping a tray (e.g., 1810, Figure 18A page 64 lines 1315) of parts (e.g., 99 of Figure 2) in a machine-vision system (e.g., system 200 of Figure 2, page 12 lines 22-30; also shown in Figure 16 as a whole and page 55 line 22-page 56 line 21, no reference number and Figure 18 as a whole, no reference number) such that opposing sides of the parts may be examined; wherein the trays (e.g., 1810) are **moved through the flipping station (1900, Figure 19) substantially parallel to their short dimension** (perpendicular to their long dimension). (Bold emphasis added.) Trays (1810) of devices (99), such as trays of semiconductor chips, associated with current vision inspection systems can be inspected on their first side (e.g., with connectors facing upwards), then the devices flipped by placing an empty tray upside-down over a tray full of devices, and inverting the trays while holding them together to simultaneously invert all devices, then removing the original lower tray so that the second side of the devices (e.g., with connectors facing downwards) can be inspected. In some prior-art systems, the flipping of trays of devices is done manually by an operator. In prior-art *Jackson et al.*, an automated flipper is described, however the path through the flipper machine is long since the trays are moved in a direction parallel to their long dimension, and the fastest speed/throughput possible is thus relatively slow. The devices will be jostled out of their pockets in the tray if accelerated or stopped too rapidly. This acceleration limit limits the speed of the trays and the minimum time to move trays into and out of the *Jackson et al.* flipping station. Since the trays are moved in a direction parallel to their long dimension, there can be fewer trays in a given path length, reducing throughput for any given speed used to move trays along that path. Further, the devices exit the *Jackson et al.* flipping station in a different tray than the one they started in, thus losing the association between markings on the tray and the devices in the tray.

In contrast, the present invention provides (e.g., linking claim 40)

40. A machine-vision system for inspecting a plurality of tray-held devices, each device having a first side and a second side, the machine-vision system comprising:

a first inspection station for inspecting a first side of the devices held in a tray that has a long-dimension side and a short-dimension side;

a second inspection station for inspecting a second side of the devices; and

a tray-transfer device that operates to **invert the devices and move the devices from the first inspection station to the second inspection station in a direction substantially perpendicular to the long dimension side of the tray** so as to reduce the distance of movement needed.

(bold emphasis added)

**FURTHER CONCISE EXPLANATION OF SUBJECT MATTER DEFINED
IN EACH INDEPENDENT CLAIM**

Independent Claims 3, 12, 37 and 43 are each directed to a system that uses a second tray, and changes the devices from a first to the second tray when flipping the devices, while moving the trays along their shorter dimension. (This is described and shown in the following places in the specification: Page 69, lines 6-10, Figure 16; Figure 18A, 18B, *see also* page 59 lines 18-21; page 67 lines 16-22; pages 73-74, lines 2-24 & lines 6-14; and Figures 19A & 19B (disclosing step-plus function and structure).) Further:

With regard to claim 3, the following concise annotated summary of the claimed invention is supplied:

3. A machine-vision system (e.g., system 200 of Figure 2, page 12 lines 22-30; also shown in Figure 16 as a whole and page 55 line 22-page 56 line 21, no reference number and Figure 18 as a whole, no reference number) for inspecting a device (99, Figure 2), ... comprising:

a first inspection station (e.g., 1610 or 1612, Figure 16; page 56 line 3-6) for inspecting a first side of a device (99);

a second inspection station (e.g., 1614 or 1616, Figure 16 page 58 line 27-page 59 line 12) for inspecting a second side of a device(99); and

a tray-transfer mechanism (e.g., Figure 18A as a whole including mechanisms 1800 and

1802, page 64 line 26-page 66 line 10) that operates to move the device (99) in a tray (e.g., 1812, Figure 18A) having a long-dimension side and a short-dimension side from the first inspection station (e.g., 1612) to the second inspection station (e.g., 1614) in a direction (left-to-right in Figure 18A) substantially perpendicular to the long-dimension side (up-and-down in Figure 18A), wherein the short dimension side (left-to-right in Figure 18A) is shorter than the long dimension side (up-and-down in Figure 18A), and wherein the tray-transfer mechanism further includes an inverting mechanism (1900, Figure 18A, Figure 19A, page 66 line 17-page 69 line 2) that operates to invert the device (99) so that the first side of the device can be inspected at the first inspection station (e.g., 1612) and the second side of the device can be inspected at the second inspection station (e.g., 1614), wherein the inverting mechanism (1900) further comprises a mechanism for flipping the devices carried in a tray, the mechanism further comprising:

- a first jaw (e.g., 1910, Figure 19A, page 66 lines 17-25) having a surface for receiving a first tray (e.g., 1810, Figure 18A page 64 lines 13-15);

- a second jaw (e.g., 1912, Figure 19A, page 66 lines 17-25) having a surface for receiving a second tray (e.g., 1812, Figure 18A; page 64 lines 13-15);

- a mover (e.g., 1920, 1911, 1913 (misabeled 1911 on upper jaw), Figure 19A; page 66 lines 20-28) for moving the first jaw (1910), the first tray (1810) carrying the device (99), the second tray (1812), and the second jaw (1912) into engagement with each other, said first tray associated with the first jaw and the second tray associated with the second jaw; and

- a rotator (1960 Figure 19A; page 67 lines 24-28) for rotating the first and second jaws.

With regard to claim 12, the following concise annotated summary of the claimed invention is supplied:

12. A machine-vision system (e.g., system 200 of Figure 2, page 12 lines 22-30; also shown in Figure 16 as a whole and page 55 line 22-page 56 line 21, no reference number and Figure 18 as a whole, no reference number)... comprising:

- a first tray (e.g., 1810, Figure 18A page 64 lines 13-15) adapted to carry a plurality of

devices (99, Figure 2);

a second tray (e.g., 1812, Figure 18A; page 64 lines 13-15) adapted to carry a plurality of devices;

a flip station (e.g., 1900, Figure 18A, Figure 19A, page 66 line 17-page 69 line 2) for flipping the plurality of devices carried in a first tray from a first inspection position in the first tray to a second inspection position in the second tray wherein the flip station further comprises:

a first jaw (e.g., 1910, Figure 19A, page 66 lines 17-25) having a surface for receiving a first tray;

a second jaw (e.g., 1912, Figure 19A, page 66 lines 17-25) having a surface for receiving a tray;

a mover (e.g., 1920, 1911, 1913 (misabeled 1911 on upper jaw), Figure 19A; page 66 lines 20-28) for moving the first jaw, a first tray having a plurality of devices, a second tray, and the second jaw into engagement with each other, ...; and

a rotator (1960 Figure 19A; page 67 lines 24-28) for rotating the first and second jaws; and

a mover (e.g., Figure 18A as a whole including mechanisms 1800 and 1802, page 64 line 26-page 66 line 10) that moves the first tray to the flip station (1900) in a direction substantially perpendicular to a longer side of the first tray to reduce a distance of travel of the first tray.

With regard to claim 17, the following concise annotated summary of the claimed invention is supplied:

17. A flipping mechanism (e.g., 1900, Figure 18A, Figure 19A, page 66 line 17-page 69 line 2) for transferring a plurality of devices from a position in a first tray (e.g., 1810, Figure 18A page 64 lines 13-15) to a position in a second tray (e.g., 1812, Figure 18A page 64 lines 13-15), the flipping mechanism comprising:

a first jaw (e.g., 1910, Figure 19A, page 66 lines 17-25) having a surface adapted to receive the first tray;

a conveyor (e.g., Figure 18A as a whole including mechanisms 1800 and 1802, page 64 line 26-page 66 line 10) that moves the first tray to the first jaw in a direction substantially

parallel to a shortest side dimension of the first tray;

a second jaw (e.g., 1912, Figure 19A, page 66 lines 17-25) having a surface adapted to receive the second tray;

a mover (e.g., 1920, 1911, 1913 (which was mislabeled 1911 on upper jaw), Figure 19A; page 66 lines 20-28) for moving the first jaw, the first tray, the second tray, and the second jaw into engagement with each other, said first tray associated with the first jaw and the second tray associated with the second jaw; and

a rotator (1960 Figure 19A; page 67 lines 24-28) for rotating the first and second jaws.

Independent Claim 20 pertains to a method that uses a second tray (e.g., 1812, Figure 18A page 64 lines 13-15), and changes the devices from a first (e.g., 1810, Figure 18A page 64 lines 13-15) to the second tray when flipping the devices, while moving the trays along their shorter dimension. (This method is described and shown in the following places in the specification: Page 69, lines 6-10, Figure 16; Figure 18A, 18B, *see also* page 59 lines 18-21; page 67 lines 16-22; pages 73-74, lines 2-24 & lines 6-14; and Figures 19A & 19B (disclosing step-plus function and structure).)

With regard to claim 37, the following concise annotated summary of the claimed invention is supplied:

37. {The page and line numbers, and Fig and reference numerals of first portion of claim 37 are as described for claim 3 above}; and

a pick-and-place mechanism (2000 Figure 16, page 71 lines 1-15) that removes rejected devices that fail an inspection at the first or second inspection station from the second tray and replaces the removed devices with good devices that passed inspection, in order to achieve an all-good tray of devices (at station 1620, Figure 16).

Claims 3-10, 12-21, 27-30, 37-39, 42, 43, 45, and 48 describe apparatus and methods that use a second tray (1812 Figure 18), and change the devices from a first tray (1810) to the second tray (1812) when flipping the devices, while moving the trays along their shorter dimension. (Page 69, lines 6-10, Figure 16; Figure 18A, 18B, *see also* page 59 lines 18-21; page 67 lines 16-

22; pages 73-74, lines 2-24 & lines 6-14 respectively; and Figures 19A & 19B (disclosing step-plus function and structure).)

Independent Claims 22, 32, and 35 (all of which are withdrawn) are each directed to a system that does not require a second tray, but places the devices back into the first tray after flipping the devices. (This is described and shown in the following places in the specification: Page 70, lines 16-19, Figures 19C-19L reference numbers 1910(jaw) and 1930 (surface) and 1931 (pusher); *see also* pages 73-74, lines 2-24 & lines 6-14; and Figures 19A & 19B (disclosing step-plus function and structure).) Since these are withdrawn by the Examiner, no further summary is provided.

Independent Claims 43 and 46 are each directed to a system that moves devices in trays perpendicular to their long-dimension side. These claims do not restrict the claim as to whether the devices end up in the same tray, or in different trays. (This is described and shown in the following places in the specification: Page 70, lines 22-23; *see also* Pages 73-74, lines 2-24 & lines 6-14, Figures 19A & 19B (disclosing step-plus function and structure).)

With regard to independent claim 43 (a means-plus-function claim), the following concise annotated summary of the claimed invention is supplied:

43. A machine-vision system (e.g., system 200 of Figure 2, page 12 lines 22-30; also shown in Figure 16 as a whole and page 55 line 22-page 56 line 21, no reference number and Figure 18 as a whole, no reference number)...comprising:

a first inspection station (e.g., 1610 or 1612, Figure 16; page 56 line 3-6) for inspecting a first side of the devices held in a tray (1810)...;

a second inspection station (e.g., 1614 or 1616, Figure 16 page 58 line 27-page 59 line 12) for inspecting a second side of the devices; and

means for inverting (1900 Figure 18A, Figure 19A, page 66 line 17-page 69 line 2; also Figure 19C-19L and page 69 line 11-page 70 line 21) the devices and [for] moving (e.g., Figure 18A as a whole including mechanisms 1800 and 1802, page 64 line 26-page 66 line 10) the devices from the first inspection station to the second inspection station in a direction substantially perpendicular to the long dimension side of the tray.

With regard to independent claim 46 (a means-plus-function claim), the following concise annotated summary of the claimed invention is supplied:

46. A machine-vision system (e.g., system 200 of Figure 2, page 12 lines 22-30; also shown in Figure 16 as a whole and page 55 line 22-page 56 line 21, no reference number and Figure 18 as a whole, no reference number)...comprising:

 a first inspection station (e.g., 1610 or 1612, Figure 16; page 56 line 3-6) for inspecting a first side of the devices held in a tray (1810)...;

 a second inspection station (e.g., 1614 or 1616, Figure 16 page 58 line 27-page 59 line 12) for inspecting a second side of the devices; and

 means for inverting (1900 Figure 18A, Figure 19A, page 66 line 17-page 69 line 2; also Figure 19C-19L and page 69 line 11-page 70 line 21) the devices and moving (e.g., Figure 18A as a whole including mechanisms 1800 and 1802, page 64 line 26-page 66 line 10) the devices from the first inspection station to the second inspection station in a direction not parallel to the long dimension side of the tray.

Note that claim 43 says trays moved in a direction substantially perpendicular to the long dimension side of the tray, while claim 46 says trays moved in a direction not parallel to the long dimension side of the tray.

Claims 43 and 46 do not specify either of the conditions (two trays or placing parts back into first tray) above and are generic to both. (Page 70, lines 22-23; *see also* Pages 73-74, lines 2-24 & lines 6-14 respectively, Figures 19A & 19B (disclosing step-plus function and structure).)

(vi) Grounds of Rejection to be Reviewed on Appeal

Appellant requests review as to whether claims 3-9, 12-21, 27-30, 40, 42, 43, 45, 46, and 48-51 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Appellant's admitted prior art [discussed on pages 2-5 of the specification] in view of *Jackson et al.* (U.S. 6,139,243), *Kawasaki* (U.S. 4,468,165) and *Hinchcliffe et al.* (U.S. 4,303,366).

(viii) Arguments

Rejection Under 35 U.S.C. § 103(a)

1) The Applicable Law for Rejections under 35 U.S.C. § 103

According to *M.P.E.P.* § 2141, which cites *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 U.S.P.Q. 182, 187 n.5 (Fed. Cir. 1986), the following tenets of patent law must be adhered to when applying 35 U.S.C. § 103. First, the claimed invention must be considered as a whole. Second, the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination. Third, the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention. Fourth, obviousness is determined using a reasonable expectation of success standard. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. *M.P.E.P.* § 2141 (citing *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966)).

The Examiner has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). The references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. *M.P.E.P.* § 2142 (citing *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985)). In considering the disclosure of a reference, it is proper to take into account not only specific

teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom. *M.P.E.P.* § 2144.01 (citing *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968)). However, if the proposed modification would render the prior-art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *M.P.E.P.* § 2143.01 (citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)).

In order to take into account the inferences which one skilled in the art would reasonably make, the examiner must ascertain what would have been obvious to one of ordinary skill in the art at the time the invention was made, and not to the inventor, a judge, a layman, those skilled in remote arts, or to geniuses in the art at hand. *M.P.E.P.* § 2141.03 (citing *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 218 USPQ 865 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984)).

The examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person. Knowledge of applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences," conduct the search and evaluate the "subject matter as a whole" of the invention. The tendency to resort to "hindsight" based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

M.P.E.P. § 2141.03.

2) *The 35 U.S.C. § 103 Rejection of Claims*

Claims 3-9, 12-21, 27-30, 40, 42, 43, 45, 46, and 48-51

Claims 3-9, 12-21, 27-30, 40, 42, 43, 45, 46, and 48-51 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Appellant's admitted prior art [discussed on pages 2-5 of the specification] in view of *Jackson et al.* (US 6,139,243) *Kawasaki* (US 4,468,165) and *Hinchcliff et al.* (US 4,303,366). Appellant respectfully traverses. To show obviousness under § 103, the burden is on the Examiner to show that, considering the claimed invention as a whole and

considering the references a whole, that the references suggest the desirability and thus the obviousness of making the combination; further, the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention. *Hodosh, supra*. Neither *Jackson et al.* nor Appellant's discussion of the prior art provide any previous recognition of a need for, or the desirability of, moving trays parallel to their short dimension rather than parallel to the long dimension of the tray. The Examiner has repeatedly asserted that it is not clear to him how moving the trays in their short dimension reduces a distance of travel or provides a speed benefit. Accordingly, the Examiner's own assertions that the Examiner is unclear of how the claimed invention provides a benefit or shortens tray-travel distances in the §112 rejection directly contradicts his assertion of the obviousness of the claims in the §103 rejection.

Even though the Examiner has now added *Kawasaki* and *Hinchliffe et al.*, both of which happen to move trays of stacked items in an automated manner (letters and the like in *Kawasaki* and cigarettes in *Hinchliffe et al.*), but neither of which describes or suggests speed or the like for their chosen orientation of their trays (*Kawasaki* describes speed in returning empty trays as follows: "However, in the third horizontal conveyor unit 30, which needs to fulfil only the function of returning empty trays, the locking mechanism as shown in FIGS. 6 and 7 may be dispensed with so that the unit can transport empty trays continuously and at a high speed." but provides no motivation for moving trays through a flipping station in a particular orientation. It is impermissible to take the teaching of the present invention to go back and say one could have changed *Jackson et al.* using *Kawasaki* and *Hinchliffe et al.* without a motivation available to one of skill in the art at the time. Appellant respectfully submits that the Examiner's several assertions during the prosecution of the present application (e.g., page 4 of Final Office Action of April 15, 2003, page 5 of Office Action of November 19, 2003, page 5 of Office Action of November 19, 2003, page 4 of Final Office Action of June 10, 2004, page 5 of Office Action of August 25, 2006, for example) that there was no speed or distance advantage provided by the recited configurations of the present claims is strong evidence that one of skill in the art had no motivation to modify *Jackson et al.* using *Kawasaki* or *Hinchliffe et al.*

Claim 3 and its dependent claims

The Final Office Action repeated arguments of the Office Action Mailed August 2006, where the Examiner first added *Hinchcliffe et al.* and *Kawasaki* to the previously cited *Jackson et al.* patent. *Hinchcliffe et al.* describe and show cigarette trays with considerable height and apparently many cigarettes stacked on one another. There is no description or suggestion of an inspection station to inspect the cigarettes. While the figures in *Hinchcliffe et al.*'s patent apparently show a tray width about equal to the length of a cigarette (or a filter for a cigarette) and a longer length, there is no mention of the relative length and width of the trays, nor of why the trays are oriented as shown, nor any discussion of possible desirability of move the trays through an inspection station in the direction recited in the present claims. In fact, *Hinchcliffe et al.*'s trays (with huge numbers of stacked cigarettes or cigarette filters) are unusable in the present claimed inspection environment since the cigarettes in the middle cannot be inspected. Moreover, *Hinchcliffe et al.* describe a tray rotation that rotates the tray full of stacked cigarettes around a line parallel to its width, empties the tray into a different type of conveying system and then, after re-rotating the tray back to its upright orientation, moves the empty tray down and backward (Figs 2 and 4) or at an angle to the incoming trays (Fig 6). The tray rotation operation that occurs in *Hinchcliffe et al.* alters the direction of the trays as they move through the system.

Kawasaki, on the other hand, stacks postal matter (envelopes or other mail items) in trays after inspection at a "reading station" and sorting. There is no tray rotation or flipping in *Kawasaki*. *Kawasaki* describes trays used to sort and transfer stacked postal matter. As with *Hinchcliffe et al.*, *Kawasaki* makes no mention of the relative length and width dimensions of the trays, and there is no discussion of the desirability of moving the trays in the direction recited in the present claims. Also akin to *Hinchcliffe et al.*, the trays in *Kawasaki* have considerable height, and therefore *Kawasaki* cannot achieve the rotation recited in certain of the present claims without altering the advantageous spacing in the present claims. Furthermore, *Kawasaki* shares *Hinchcliffe et al.*'s problem that the stacked objects in the middle of the tray (in *Kawasaki*'s case, postal matter) cannot be inspected, and thus the *Kawasaki* system could not work with the presently amended claims.

There is no description or suggestion in *Hinchcliffe et al.* or *Kawasaki* of a smaller footprint or other benefit that would motivate one of skill in the art to combine the non-inspection tray movement of those references with the tray-flipping inspection system of *Jackson*

et al. Further, both *Hinchcliffe et al.* and *Kawasaki* stack the items in their trays, making it impossible to inspect all the items in the trays. In summary, there is nothing in the cited prior art that would motivate one of skill in the art at the time of the invention to combine *Hinchcliffe et al.*'s cigarette-tray-emptying system or *Kawasaki's* sorting and conveying system into that of *Jackson et al.*, as proposed by the Examiner. The Examiner asserts that moving trays along a direction perpendicular to the long side is well known as evidenced by *Hinchcliffe et al.* or *Kawasaki*. However, Appellant respectfully submits that there is no motivation in the prior art for the proposed combination since the trays of *Hinchcliffe et al.* (carrying cigarettes from one station to another and dumping them into a different conveyor) or *Kawasaki* (carrying stacked mail without jumbling the stack) serve a different purpose than *Jackson et al.* (separating a single layer of devices for inspection). Further, *Kawasaki* reads data (inspects) from the postal matter before stacking the pieces into trays and has no description or suggestion of looking at the back side of the objects, and there is no description or suggestion in *Hinchcliffe et al.* of inspecting the cigarettes, which are randomly jumbled in piles in their trays.

According to MPEP 2141, "the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination." Appellant respectfully submits that the Examiner has failed to provide a motivation for combining these references, or if there is a motivation that it is impermissibly from the present application.

In contrast to the cited references, one benefit to the current claims is that the recited direction allows a tray-to-tray spacing that allows for a smaller overall footprint in an inspection environment. The Examiner cites this benefit as motivation to combine. However, this benefit is provided by the present disclosure and is not in the reference. There is nothing in the cited prior art that would motivate one of skill in the art at the time of the invention to combine *Hinchcliffe et al.*'s cigarette trays and their conveying system or the trays of stacked postal material of *Kawasaki* into that of *Jackson et al.*, as proposed by the Examiner. Appellant respectfully asserts that the tall trays of *Hinchcliffe et al.* and of *Kawasaki* would not work in the machine-vision inspection system invention of the present claims of our application nor in the system described by *Jackson et al.* Appellant respectfully submits that the Examiner has failed to provide a motivation for combining these references, or if there is a motivation that it is impermissibly from the present application.

It is only with the teaching of the present disclosure that this improvement is provided. Appellant's specification has provided substantial and adequate teaching to provide one of skill in the art a full and complete understanding of the advantages of the claimed invention over the prior art. The *Jackson et al.* system is not capable of such advantages. The *Hinchcliffe et al.* and *Kawasaki* patents have different trays (having stacked items in configurations that cannot be inspected) and do not provide any suggestion as to the desirability of using their configurations for speed through an inspection station or space from input-through inspection, flipping, and more inspection-to-output. The *Jackson et al.* prior art moves the trays parallel to their long dimension, and the trays of stacked items in *Kawasaki* and *Hinchcliffe et al.* do not suggest the proposed combination. There is no recognition that *Jackson et al.*'s orientation leads to longer distances in an inspection system than possible with the present invention.

The non-obviousness of the present invention is further evidenced by the Examiner's failure, in earlier Office Actions, to appreciate that moving the trays in a direction parallel to their short dimension would lessen the distance needed to move trays between stations (since the stations could be placed closer to one another) or the per-tray travel time between inspections at a given tray speed (if the stations are kept at a fixed distance apart and more trays are placed along the path between stations). See the Examiner's arguments relative to the **§ 112 Rejection** in the Office Action mailed April 15, 2003 and in the Office Action mailed June 10, 2004.

Further, the Examiner analogized in the August 25, 2006 non-final Office Action that, because the distance of travel between two cities cannot be reduced by traveling in a shorter car, Appellants cannot assert that the claimed perpendicular direction reduces the travel distance between inspection stations; this analogy is not applicable to the present application. Cities are not moved closer together because shorter cars are used in traveling between them; however, inspection stations can be placed closer together by shortening the trays moving between the stations. Further, if shorter cars were used on the highway between the Examiner's hypothetical two cities, then for any given spacing between cars (say zero feet/bumper-to-bumper for very slow traffic, or, e.g., 100 feet between the back of one car and the front of the next car, for cars traveling 60mph) and for any given speed, more cars travel between the two cities in each hour (i.e., providing higher throughput). Unlike cities, which cannot be moved, inspection stations in a machine-vision system can be easily moved and reconfigured to take advantage of moving

trays in their short dimension. Just because it is easy to do so, does not mean that it is obvious to do so. Further, Appellant's recitation of the movement relative to the short-dimension direction or the long-dimension direction clearly distinguishes the claimed invention from the cited prior art, without the need to further recite in the claims the advantages obtained by the claims as recited.

Appellant respectfully submits that the Examiner's oft-repeated previous dismissals of tray orientation as a matter of design choice to one of skill in the art based on criteria such as space optimization, and his recent assertion that moving trays along a direction perpendicular to the long side "such as to fit more trays on the conveying means is old and well-known in the art as evidenced by *Kawasaki* (note at least trays 22) and *Hinchcliffe et al.* (note at least trays 14); therefore it would have been obvious to a person having ordinary skill in the art to move the trays of the admitted prior art modified as above along a direction as taught by *Kawasaki* and *Hinchcliffe et al.* to fit more trays on the conveying means" is only possible after absorbing the teaching of the present application.

Kawasaki and *Hinchcliffe et al.* make no mention of any advantage of their orientation, so perhaps for them, it is merely a matter of design choice, but this does not provide a motivation to modify *Jackson et al.* Based on the Examiner's own reasoning that orientation of the trays does not affect the distance traveled, the orientation of the trays would not affect the space needed: three trays oriented with their long dimension in the direction of travel take the same area as three trays oriented with their short dimension in the direction of travel. It is only with Appellant's teaching that any such problem (such as shortening the distance of tray travel between stations, or shortening the overall length of the machine in the direction of travel) and solution is provided. There is no indication in *Jackson et al.* of a desirability to move the trays along the short dimension.

Jackson et al. move the trays along the tray's long dimension (note *Jackson et al.* Fig.1 where the axis of rotation 42 is parallel to the direction of tray travel shown by the arrow, and Fig. 4 where the axis of flip rotation 42 is parallel to the long dimension of the tray), thus increasing the time needed to transfer the trays to and from the flip station. In contrast, the present claimed invention of claims 3, 12, and 20 as amended, and their respective dependent claims recite moving the trays (to or from the flip station) in a direction perpendicular to the

long-side dimension or parallel to the short-side dimension of the tray. This short-dimension movement reduces the time of travel, shrinks the footprint size of the conveyor needed, and reduces the jostling and shaking of the devices in the tray due to fast start and stop motions if the trays were moved in the long dimension in the same amount of time (if the devices are moving when moved to the second inspection time due to jostling in the trays, extra time must be wasted to wait for the devices to stop moving so a picture can be taken). Accordingly, claims 3, 12, 17, 20 and 40 and their dependent claims appear in condition for allowance and reversal of the rejection is respectfully requested.

Accordingly, claim 3 and its dependent claims appear in condition for allowance and reversal of the rejection is respectfully requested.

The Other Claims

Appellant intends that the above arguments also apply to appropriate places in the other claims described below, and asks that the claims be considered as a whole including the above arguments, so as not to burden the reader with unneeded repetitions of arguments already made.

Claim 9

Claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Appellant's admitted prior art [discussed on pages 2-5 of the specification] in view of *Jackson et al.*, *Kawasaki* and *Hinchcliffe et al.* Appellant respectfully traverses. The Examiner asserted that it was deemed inherent that specific structures of the present invention for claim 9 are inherent in the cited prior art, but provides no evidence of this. The Examiner has failed to show any structure equivalent to the description in the present application for a **means for moving the second inspection station with respect to the inverting mechanism**. Reversal of the rejection is respectfully requested.

Claim 13

Claim 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Appellant's

admitted prior art [discussed on pages 2-5 of the specification] in view of *Jackson et al.*, *Kawasaki* and *Hinchcliffe et al.* Appellant respectfully traverses. The Examiner has failed to show a first tray-transfer device for holding at least the first tray, said first tray-transfer device moving the first tray from the first inspection station to the flip station; and a second tray-transfer device for holding at least the second tray, said second tray-transfer device moving the second tray from the flip station to the second inspection station. *Jackson et al.* show a single continuous conveyer 54. Reversal of the rejection is respectfully requested.

Claim 14

Claim 14 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Appellant's admitted prior art in view of *Jackson et al.*, *Kawasaki* and *Hinchcliffe et al.* Appellant respectfully traverses. The Examiner asserted that it was deemed inherent that specific structures of the present invention for claim 14 are inherent in the cited prior art, but provides no evidence of this. The Examiner has failed to show a mechanism for flipping the devices carried in a tray, the mechanism further comprising **means for limiting the motion of the rotator**. Reversal of the rejection is respectfully requested.

Claim 17

Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Appellant's admitted prior art in view of *Jackson et al.*, *Kawasaki* and *Hinchcliffe et al.* Appellant respectfully traverses. The Examiner has failed to show a flipping mechanism for transferring a plurality of devices from a position in a first tray to a position in a second tray, the flipping mechanism comprising: a first jaw having a surface adapted to receive the first tray; a conveyor that moves the first tray to the first jaw in a direction substantially parallel to a shortest side dimension of the first tray; a second jaw having a surface adapted to receive the second tray; a mover for moving the first jaw, the first tray, the second tray, and the second jaw into engagement with each other, said first tray associated with the first jaw and the second tray associated with the second jaw; and a rotator for rotating the first and second jaws. Reversal of the rejection is respectfully requested. The Examiner has failed to refute any aspect of

Appellant's argument for this claim. Reversal of the rejection is respectfully requested.

Claim 20

Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Appellant's admitted prior art in view of *Jackson et al.*, *Kawasaki* and *Hinchcliffe et al.* Appellant respectfully traverses. The Examiner has failed to show in the prior art a method for acquiring physical information associated with a plurality of devices placed in a tray, the method comprising the steps of: inspecting a first side of a device within a first tray; moving the first tray in a direction substantially perpendicular to a longer side of the first tray to reduce a distance of travel of the first tray to a flip station; moving a second tray to a position near the first tray; flipping the first tray and second tray to move the device from the first tray to the second tray and place the device in the second tray so that a second side of the device is presented in the second tray; and inspecting a second side of the device within the second tray. Reversal of the rejection is respectfully requested

Claims 10, 37-39

Claims 10 and 37-39 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Appellant's admitted prior art [discussed on pages 2-5 of the specification] in view of *Jackson et al.*, *Kawasaki* and *Hinchcliffe et al.*, as applied to claims 3-9, 12-21, 27-30, 40, and 42, and further in view of Bilodeau (US 5,691,810). Appellant respectfully traverses. To show obviousness under § 103, the burden is on the Examiner to show that, considering the claimed invention as a whole and considering the references a whole, that the references suggest the desirability and thus the obviousness of making the combination; further, the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention. *Hodosh, supra.* Neither *Jackson et al.*, nor Appellant's discussion of the prior art, nor Bilodeau provide any prior-art recognition of a need for, or the desirability of, moving trays parallel to their short dimension in a trayed-part inspection system rather than parallel to the long dimension of the tray. *Kawasaki* and *Hinchcliffe et al.* describe stacked items in their trays that cannot provide inspect-ability of most of the items in their trays. Accordingly, claims 37-39 and 10 appear in condition for allowance and reversal of the rejection is respectfully requested.

Claims 40, 41-42

Regarding claim 40 and its dependent claims 41-42, the cited references do not show a tray-transfer device combined with the other elements that moves the devices from the first inspection station to the second inspection station in a direction substantially perpendicular to the long-dimension side of the tray. Accordingly, claims 40 and its dependent claims 41-42 appear in condition for allowance and reversal of the rejection is respectfully requested.

Further, claim 40 provides a generic linking claim between independent claims 3, 12, 17, 20, 37 and independent claims 22 and 32, and dependent claim 41. Thus, claim 3 (and its dependent claims 4, 5, 6, 7, 8, 9, 10, and 27), 12 (and its dependent claims 13, 14, 15, 16 and 28), 17 (and its dependent claims 18, 19 and 29), and 20 (and its dependent claims 21 and 30); and independent claims 22 (and its dependent claims 23, 24, 25 and 31) and 32 (and its dependent claims 33, 34, 36) are linked by a generic claim 40. Accordingly, reversal of the restriction of claim 40 is respectfully requested.

Claims 43, 44, 45, and 46, 47, 48

Regarding claim 43 and its dependent claims 44-45 and claim 46 and its dependent claims 47-48, the cited references do not show the equivalent structure for the means for inverting as recited (and combined with the other elements) and for moving the devices from the first inspection station to the second inspection station in a direction substantially perpendicular to the long-dimension side of the tray. Specifically, *Jackson et al.* show grasping the tray and lifting it off its conveying belt, then flip at a height, then lower back to the conveying belt. In contrast, the structures used in the present invention flip the tray for the means for flipping flip without raising and are not equivalent structures. Claim 43 is a means-plus-function claim that must be examined under 35 U.S.C. § 112 paragraph 6 to cover the corresponding structure, materials or acts described in the specification and equivalents thereof. The Examiner has failed to provide any showing of structure or acts equivalent to those described in the present specification to provide the recited means. Accordingly, Appellant respectfully requests that the rejection be reversed.

Further, claims 43 and 46 each provide a generic linking claim between independent

claims 3, 12, 17, 20, 37 and independent claims 22 and 32, and dependent claims 41, 44, 45, 47, and 48. Thus, claim 3 (and its dependent claims 4, 5, 6, 7, 8, 9, 10, and 27), 12 (and its dependent claims 13, 14, 15, 16 and 28), 17 (and its dependent claims 18, 19 and 29), and 20 (and its dependent claims 21 and 30); and independent claims 22 (and its dependent claims 23, 24, 25 and 31) and 32 (and its dependent claims 33, 34, 36) and dependent claims 44, 45, 47, and 48 are linked by generic claims 43 and 46. Since the generic linking claims appear allowable as described above, reversals of the rejections and restrictions are respectfully requested.

Claims 46, 47-48

Regarding claim 46 and its dependent claims 47-48, Appellant respectfully submit that the cited references do not show the equivalent structure for the means for inverting as recited (and combined with the other elements) and for moving the devices from the first inspection station to the second inspection station in a direction not parallel to the long dimension side of the tray. Claim 46 is a means-plus-function claim that must be examined under 35 U.S.C. § 112 paragraph 6 to cover the corresponding structure, materials or acts described in the specification and equivalents thereof. The Examiner has failed to provide any showing of structure or acts equivalent to those described in the present specification to provide the recited means. Accordingly, Appellant respectfully requests that the rejection be reversed and that these claims be allowed.

Claims 22, 44, 47 (all of which stand withdrawn)

With regard to the rejection of claims 22, 44, and 47, Appellant respectfully traverses any rejection, and has presented liking claims as just described. *Jackson et al.* only discuss flipping the devices from a first tray into a second tray and then passing the second tray. In such a system, any identification or markings on the first tray that are associated with a particular set or batch of devices are no longer associated with the devices once they are placed in the second tray. Neither *Jackson et al.* nor the Appellant's discussion of the prior art flips the devices and then puts the devices back into the same tray. In contrast, the present Figures 19c-19g show flipping a plurality of devices and then placing them back into the same tray. Accordingly, the claims appear to be in condition for allowance, and reconsideration and reversal of the rejections

and restrictions are respectfully requested.

Claims 49-51

Regarding claim 49, the Examiner asserted that the spacing between the inspection stations would have been an obvious matter of design choice to a person having ordinary skill in the art based on such factors as preference, design criteria such as size of the inspection station or of the devices being inspected or presence of other apparatus in between, however he fails to show how or why one could modify *Jackson et al.* in the recited manner. It is impermissible to dismiss the teaching and advantages of the present application as mere design choice when the advantages derived from the present configuration are not described, suggested, or even available using the design of *Jackson et al.*

Regarding claim 50, the Examiner asserted that the rotation axis would have been an obvious matter of design choice to a person having ordinary skill in the art based on such factors as preference, design criteria, space optimization, and he fails to see new/unexpected results by modifying *Jackson et al.* in the recited manner. However, the configuration of *Jackson et al.* required that their devices pass through an enclosed space for the operation of their flipper, and continuing to rotate the tray about an axis parallel to the direction of travel would have put additional centrifugal forces on the outer devices when flipping the tray around the sort-dimension axis even if one had a motivation to change the direction of travel through the flipper. It is impermissible to dismiss the teaching and advantages of the present application as mere design choice when the advantages derived from the present configuration are not described, suggested, or even available using the design of *Jackson et al.*

As to claim 50, again the Examiner is picking and choosing which features to combine from *Kawasaki* and *Hinchcliffe et al.* Both of these references stack many layers of items in their trays, thus obtaining a greater number of items throughput. This increase in throughput is a motivating factor for loading the multiple layers, but such a combination with *Jackson* does not increase throughput since the devices cannot be inspected when stacked. It is only with the teaching of the present invention that the advantages of the recited claim language become available. Accordingly, the above three claims appear to be in condition for allowance, and

reconsideration and reversal of the rejections and restrictions are respectfully requested.

Further Remarks

Following the February 5, 2007 Final Office Action, Appellant filed an Amendment and Response on April 5, 2007. Two days later the Examiner issued an Advisory Action dated April 7, 2007, in which the Examiner did not consider any of the arguments in the Appellant's April 5, 2007 Response to the February 5, 2007 Final Office Action. Rather, solely on the basis of Appellant's *de minimus* alteration of language in claim 21 from perpendicular to "**a longer**" side to perpendicular to "**the length**" side in Appellant's Response to Final Office Action as required by the Examiner, the Examiner in the April 7th Advisory Action maintained that "The proposed change to claim 21 raises new issues that would require further consideration and search." Appellant respectfully traversed this reasoning in the response filed April 22, 2007 by Appellant. (It is to be pointed out that Appellant's April 5th *de minimus* change in language to claim 21, to clarify antecedent basis, was necessitated by the Examiner's remark in the February 5th Final Office Action: 'In claim 21, it is not clear how the "longer side" is related to the "length side".') The Examiner did not explicitly specify any new issue that was raised by the proposed modest change in language in claim 21 that could possibly require a new search, and the Appellant obviously could not respond to something that had not been identified. However, the Appellant saw no new issues that would be raised by the proposed change in claim 21 that would require further search, and therefore respectfully traversed the Examiner's statement that "The proposed change to claim 21 raises new issues that would require further consideration and search." Solely to advance prosecution of the present case, in a subsequent Amendment and Response filed April 22, 2007 in reply to the April 7, 2007 Advisory Action, the Appellant cancelled claim 21. Since the sole objection raised in the April 7, 2007 Advisory Action was in relation to a proposed change in the language of claim 21, Appellant's cancelling of claim 21 simplified the issues that were to be considered. Appellant therefore respectfully requested that the Examiner respond in full to Appellant's Remarks in the April 22, 2007 Response, which were Remarks duplicated from Appellant's April 5, 2007 Response – to which the Examiner had not responded. Instead of responding fully to Appellant's remarks filed April 5, 2007 or April 22, 2007,

however, the Examiner issued an Advisory Action dated April 30, 2007, in which the Examiner perfunctorily remarked, "It is deemed that the Final rejection is still applicable."

Conclusion

It is respectfully submitted that the claimed invention is patentable in view of the cited art. It is respectfully submitted that claims 3-10, 12-21, 27-30, 37-40, 42, 43, 45, 46 and 48-51 should therefore be allowed. Reversal of the Examiner's rejections of claims 3-10, 12-21, 27-30, 37-40, 42, 43, 45, 46 and 48-51 is respectfully requested.

Respectfully submitted,

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Date: June 22, 2007

By: /Charles A. Lemaire/
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CERTIFICATE UNDER 37 CFR 1.8(a)(1)(i)(C) (paragraph C being a new amendment to Section 1.8 published in the Federal Register, Vol. 22, No. 14, Tuesday, Jan. 23, 2007, page 2773): The undersigned hereby certifies that this document is being electronically filed via the U.S. Patent Office's EFS filing system on this **22nd day of June, 2007, Central Time**, addressed to: Mail Stop APPEAL BRIEF - PATENTS, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

By: /Charles A. Lemaire/
Charles A. Lemaire, Reg. No. 36,198

(viii) Appendix A - The Claims Under Appeal:

1-2. (Cancelled)

3. (Previously presented) A machine-vision system for inspecting a device, the device having a first side and a second side, the machine-vision system comprising:

- a first inspection station for inspecting a first side of a device;
- a second inspection station for inspecting a second side of a device; and
- a tray-transfer mechanism that operates to move the device in a tray, the tray having a height, a long-dimension side and a short-dimension side, from the first inspection station to the second inspection station in a direction substantially perpendicular to the long-dimension side, wherein the short dimension side is shorter than the long dimension side and longer than the height, and wherein the tray-transfer mechanism further includes an inverting mechanism that operates to invert the device so that the first side of the device can be inspected at the first inspection station and the second side of the device can be inspected at the second inspection station, wherein the inverting mechanism further comprises a mechanism for flipping the devices carried in a tray, the mechanism further comprising:
 - a first jaw having a surface for receiving a first tray;
 - a second jaw having a surface for receiving a second tray;
 - a mover for moving the first jaw, the first tray carrying the device, the second tray, and the second jaw into engagement with each other, said first tray associated with the first jaw and the second tray associated with the second jaw; and
 - a rotator for rotating the first and second jaws.

4. (Original) The machine-vision system of claim 3 wherein the mover moves the first jaw in a direction substantially perpendicular to the surface for receiving a tray associated with the first jaw.

5. (Original) The machine-vision system of claim 3 wherein the mover moves the first jaw and the second jaw in a direction substantially perpendicular to the surface for receiving a tray

associated with the first jaw.

6. (Previously presented) The machine-vision system of claim 3 wherein the inverting mechanism moves the plurality of devices to the second tray such that the second sides of the plurality of devices are presented for inspection.

7. (Previously presented) The machine-vision system of claim 3 wherein the rotator of the inverting mechanism moves the plurality of devices to the second tray such that the second sides of the plurality of devices are presented for inspection.

8. (Original) The machine-vision system of claim 6 wherein the mover of the inverting mechanism is adapted to place the plurality of devices in the second tray at the second inspection station.

9. (Previously presented) The machine-vision system of claim 8 wherein the tray transfer device includes means for moving the second inspection station with respect to the inverting mechanism.

10. (Original) The machine-vision system of claim 8 further comprising a picker for picking devices which fail inspection from the second tray.

11. (Cancelled)

12. (Previously presented) A machine-vision system for inspecting a plurality of devices positioned within a plurality of device-carrying trays, the machine-vision system comprising:

- a first tray adapted to carry a plurality of devices, the first tray having a height, a length side and a width side, wherein the length side is longer than the width side and the height is shorter than the width side;
- a second tray adapted to carry a plurality of devices;
- a flip station for flipping the plurality of devices carried in a first tray from a first

inspection position in the first tray to a second inspection position in the second tray wherein the flip station further comprises:

a first jaw having a surface for receiving a first tray;

a second jaw having a surface for receiving a tray;

a mover for moving the first jaw, a first tray having a plurality of devices, a second tray, and the second jaw into engagement with each other, said first tray associated with the first jaw and the second tray associated with the second jaw; and

a rotator for rotating the first and second jaws; and

a mover that moves the first tray into and out of the flip station in a direction substantially perpendicular to the length side of the first tray.

13. (Previously presented) The machine-vision system of claim 12 further comprising:

a first tray-transfer device for holding at least the first tray, said first tray-transfer device moving the first tray from the first inspection station to the flip station; and

a second tray-transfer device for holding at least the second tray, said second tray-transfer device moving the second tray from the flip station to the second inspection station.

14. (Previously presented) The machine-vision system of claim 12 wherein the flip station further comprises a mechanism for flipping the devices carried in a tray, the mechanism further comprising means for limiting the motion of the rotator.

15. (Original) The machine-vision system of claim 12 wherein the mover moves the first jaw in a direction substantially perpendicular to the surface for receiving a tray associated with the first jaw.

16. (Original) The machine-vision system of claim 12 wherein the mover moves the first jaw and the second jaw in a direction substantially perpendicular to the surface for receiving a tray associated with the first jaw.

17. (Previously presented) A flipping mechanism for transferring a plurality of devices from a position in a first tray to a position in a second tray, the flipping mechanism comprising:

a first jaw having a surface adapted to receive the first tray;

a conveyor that moves the first tray to the first jaw in a direction substantially parallel to a shortest side dimension of the first tray;

a second jaw having a surface adapted to receive the second tray;

a mover for moving the first jaw, the first tray, the second tray, and the second jaw into engagement with each other, said first tray associated with the first jaw and the second tray associated with the second jaw; and

a rotator for rotating the first and second jaws.

18. (Previously presented) The flipping mechanism of claim 17 wherein the mover can be controlled to remove the first tray from a first inspection surface.

19. (Previously presented) The flipping mechanism of claim 17 wherein the mover can be controlled to place the second tray at a second inspection surface.

20. (Previously presented) A method for acquiring physical information associated with a plurality of devices placed in a tray, the tray having a height, a length side and a width side, wherein the height is shorter than the width side and the width side is shorter than the length side, the method comprising the steps of:

inspecting a first side of a device within a first tray;

moving the first tray in a direction substantially parallel to the width side of the first tray;

moving a second tray to a position near the first tray;

flipping the first tray and second tray to move the device from the first tray to the second tray and place the device in the second tray so that a second side of the device is presented in the second tray; and

inspecting a second side of the device within the second tray.

21. (Cancelled)

22. (Withdrawn) A machine-vision system for inspecting a plurality of devices and for inverting the plurality of devices from being positioned in a first tray, the machine-vision system comprising:

- a first jaw having a surface for receiving the first tray;
- a second jaw having a surface;
- a mover for moving the first jaw, the first tray having a plurality of devices, and the second jaw into engagement with each other, said first tray associated with the first jaw; and
- a rotator that rotates the first and second jaws to a position such that the devices are inverted and supported by the second jaw and are then are placed back into the first tray in the inverted position.

23. (Withdrawn) The machine-vision system of claim 22 further comprising;

- a first conveyer for moving the first tray having a plurality of devices therein to the first jaw; and
- a second conveyer for moving the first tray having a plurality of devices therein from the first jaw.

24. (Withdrawn) The machine-vision system of claim 22 wherein the first jaw is capable of holding, in any position, a tray devoid of devices.

25. (Withdrawn) The machine-vision system of claim 22 further comprising;

- a slider for transferring the inverted devices from the second jaw into the first tray.

26. (Cancelled)

27. (Previously presented) The machine-vision system of claim 3 wherein the rotator rotates the first and second jaws simultaneously.

28. (Previously presented) The machine-vision system of claim 12 wherein the rotator rotates

the first and second jaws simultaneously.

29. (Previously presented) The flipping mechanism of claim 17 wherein the rotator rotates the first and second jaws simultaneously.

30. (Previously presented) The method of claim 20, wherein moving the second tray to the position near the first tray further includes moving the second tray to engage the first tray, and wherein flipping the first tray and second tray is done simultaneously after engagement.

31. (Withdrawn) The machine-vision system of claim 22 wherein the rotator rotates the first and second jaws simultaneously.

32. (Withdrawn) A machine-vision system for inspecting a plurality of devices, each device having a first side and a second side, the machine-vision system comprising:

a first inspection station for inspecting a first side of the devices held in a tray;

a second inspection station for inspecting a second side of the devices held in the tray;

and

a tray-transfer device that operates to move the devices from the first inspection station to the second inspection station, said tray-transfer device further including an inverting mechanism that operates to invert the devices and place the devices back into the same tray so that the first side of the devices can be inspected at the first inspection station in the tray and the second side of the device can be inspected at the second inspection station in the tray.

33. (Withdrawn) The system of claim 32 wherein the tray has a long dimension side and a short dimension side, and is moved from the first inspection position to the inverting mechanism in a direction substantially perpendicular to the long dimension side so as to reduce the amount of movement needed.

34. (Withdrawn) The system of claim 33 wherein the inverting mechanism is positioned between the first inspection position and the second inspection position, and wherein the tray has

a long dimension side and a short dimension side, and is moved from the first inspection position to the inverting mechanism and to the second inspection position in a direction substantially perpendicular to the long dimension side so as to reduce the amount of movement needed.

35. (Withdrawn) A machine-vision system for inspecting a plurality of devices positioned within a plurality of device-carrying trays, the machine-vision system comprising:

- a first tray adapted to carry a plurality of devices;

- a flip station for flipping the plurality of devices carried in the first tray from a first inspection position in the first tray to a second inspection position in the first tray.

36. (Withdrawn) The machine-vision system of claim 34, wherein the flip station further comprises a mechanism for flipping the devices while the devices are carried in a tray.

37. (Previously presented) A machine-vision system for inspecting a device, the device having a first side and a second side, the machine-vision system comprising:

- a first inspection station for inspecting a first side of a plurality of devices;

- a second inspection station for inspecting a second side of the plurality of devices;

- a tray-transfer device that operates to move the devices in a tray from the first inspection station to the second inspection station, said tray-transfer device further including an inverting mechanism that operates to invert the devices so that the first side of the devices are inspected at the first inspection station and the second side of the devices are inspected at the second inspection station, wherein the inverting mechanism further comprises a mechanism for flipping the devices carried in a tray, the mechanism further comprising:

- a first jaw having a surface for receiving a first tray;

- a second jaw having a surface for receiving a second tray;

- a mover that moves the second jaw such that the second tray comes into engagement with the first tray, said first tray associated with the first jaw and the second tray associated with the second jaw; and

- a rotator for rotating the first and second jaws; and

- a pick-and-place mechanism that removes rejected devices that fail an inspection at the

first or second inspection station from the second tray and replaces the removed devices with good devices that passed inspection, in order to achieve an all-good tray of devices.

38. (Previously presented) The system of claim 37, wherein the first inspection station is a three-dimensional scanning station that provides height measurements for a plurality of points on a first side each device.

39. (Previously presented) The system of claim 38, further comprising a third inspection station that provides two-dimensional measurements for a plurality of points on the first side each device.

40. (Previously presented) A machine-vision system for inspecting a plurality of tray-held devices, each device having a first side and a second side, the machine-vision system comprising:

- a first inspection station for inspecting a first side of the devices held in a single layer in a tray that has a long-dimension side and a short-dimension side, wherein the long-dimension side is longer than the short-dimension side;

- a second inspection station for inspecting a second side of the devices; and

- a tray-transfer device that operates to invert the devices and move the devices from the first inspection station to the second inspection station in a direction substantially perpendicular to the long dimension side of the tray.

41. (Withdrawn) The system of claim 40 wherein tray-transfer device operates to invert the devices and place the devices back into the same tray so that the first side of the devices can be inspected at the first inspection station in the tray and the second side of the device can be inspected at the second inspection station in the same tray.

42. (Previously presented) The system of claim 40 wherein tray-transfer device operates to invert the devices and place the inverted devices into a different tray than that used at the first inspection station.

43. (Previously presented) A machine-vision system for inspecting a plurality of tray-held devices, each device having a first side and a second side, the machine-vision system comprising:

a first inspection station for inspecting a first side of the devices held in a tray that has a long-dimension side and a short-dimension side that is shorter than the long-dimension side;

a second inspection station for inspecting a second side of the devices; and

means for inverting the devices and moving the devices from the first inspection station to the second inspection station in a direction substantially perpendicular to the long dimension side of the tray.

44. (Withdrawn) The system of claim 43, wherein the means for inverting operates to invert the devices and place the devices back into the same tray so that the first side of the devices can be inspected at the first inspection station in the tray and the second side of the device can be inspected at the second inspection station in the same tray.

45. (Previously presented) The system of claim 43, wherein means for inverting operates to invert the devices and place the inverted devices into a different tray than that used at the first inspection station.

46. (Previously presented) A machine-vision system for inspecting a plurality of tray-held devices, each device having a first side and a second side, the machine-vision system comprising:

a first inspection station for inspecting a first side of the devices held in a tray that has a long-dimension side and a short-dimension side that is shorter than the long-dimension side;

a second inspection station for inspecting a second side of the devices; and

means for inverting the devices and moving the devices from the first inspection station to the second inspection station in a direction not parallel to the long dimension side of the tray.

47. (Withdrawn) The system of claim 46, wherein the means for inverting operates to invert

the devices and place the devices back into the same tray so that the first side of the devices can be inspected at the first inspection station in the tray and the second side of the device can be inspected at the second inspection station in the same tray.

48. (Previously presented) The system of claim 46, wherein means for inverting operates to invert the devices and place the inverted devices into a different tray than that used at the first inspection station.

49. (Previously presented) The system of claim 3, wherein the tray-transfer mechanism transfers a plurality of trays, and wherein the first inspection station and the second inspection station are spaced apart by less than two times a length of the long-dimension side of each tray.

50. (Previously presented) The system of claim 3, wherein the inverting mechanism rotates the device around an axis that is not parallel to the direction that the tray moves between the first inspection station and second inspection station.

51. (Previously presented) The system of claim 12, wherein all of the devices within one of the plurality of device-carrying trays are positioned to be inspected from a single inspection face of the tray.

(ix) EVIDENCE APPENDIX:

None.

(x) RELATED-PROCEEDINGS APPENDIX:

None.

(There are no other appeals or interferences known to Appellants that will have a bearing on the Board's decision in the present appeal.)